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ENHANCING QUALITY RESEARCH &

**INNOVATION**

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**SOCIETAL**

**DEVELOPMENT**





## PP-2                      **Production of an Online Arabic Vocabulary Games Learning Prototype**

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This online Arabic vocabulary games learning prototype is a research-based product from the design and development methods, approaches and phases for elementary learners at the Centre for Foundation Studies (CFS), International Islamic University Malaysia (IIUM). The effort to produce this learning prototype is an attempt to integrate game-based learning in an online environment, to provide new learning experience for learners who have been through a traditional Arabic teaching and learning methods by using ordinary text book. This games prototype aims at increasing the learner's motivation in learning Arabic language through the technology of online games which is the interest of major teenagers nowadays. The exploration of this online game-based learning prototype potential for use in teaching and learning Arabic language in real setting by learners and teachers is also among the steps taken to evaluate the prototype theoretically and practically. The link for website is : <http://www.arabic-games-iium.net>

## PP-3                      **Simulation of a Virtual Transducer Using Potentiometer**

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This work attempts to design and implement in hardware a transducer with a nonlinear response using potentiometer. Potentiometer is regarded as a linear transducer, while a the response of a nonlinear transducer can be treated as a concatenation of linear segments made out of the response curve of an actual nonlinear transducer at the points of inflections being exhibited by the nonlinear curve. Each straight line segment is characterized by its slope and a constant, called the y-intercept, which is ultimately realized by a corresponding electronic circuit. The complete circuit diagram is made of three stages: (i) the input stage for range selection, (ii) a digital logic to make appropriate selection, (iii) a conditioning circuit for realizing a given straight-line segment identified by its relevant slope and reference voltage. The simulation of the circuit is carried using MULTISIM, and the designed circuit is afterward tested to verify that variations of the input voltage give us an output voltage very close to the response pattern envisaged in the analytical stage of the design. The utility of this work lies in its applications in emulating purpose built transducers that could be used to nicely emulate a transducer in a real world system that is to be controlled by a programmable digital system.

## PP-10                      **A Breathing Microbattery: Zn/MCM-41/O<sub>2</sub> System**

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A high energy density, Zn/MCM-41/O<sub>2</sub> microbattery of 1.5 V, measured 1 cm<sup>2</sup> area and 100 μm thick, was able to produce current as high as 27 mA. The electrochemical system is popularly dubbed as breathing battery since it utilizes oxygen from ambient air, which is free, unlimited, and does not requires storage. A novel nanoporous inorganic MCM-41 material which consists of hexagonally-ordered pore structure has been introduced as an ionic exchange membrane-cum-electrolyte matrix. MCM-41 material is characterized by its large surface area and pore volume, narrow pore size distribution, tuneable pore size, adjustable hydrophobicity and very good thermal stability. Zn/MCM-41/O<sub>2</sub> microsystem showed promise for near future use in RFID applications and, cosmetic and drug delivery patches.